

# **Long Beach Water Department Seawater Desalination**

*Presented by*

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# ***LBWD's Phased Approach***

① Pilot Testing (on-going)

💧 AWWARF

② Prototype (2004 - 2006)

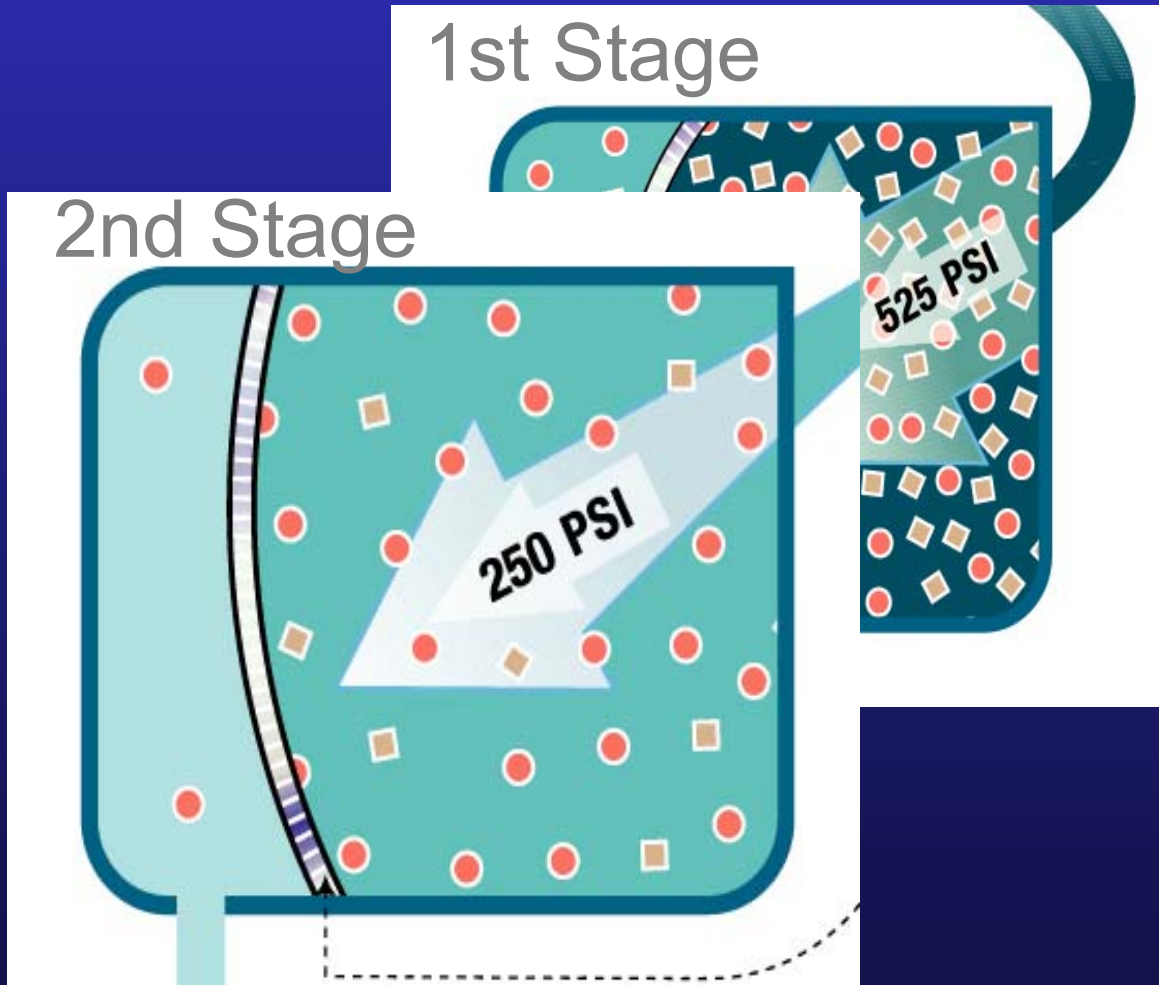
💧 USBR

💧 LADWP

③ Production Plant (~2010)

# *2-Stage Nanofiltration (NF<sup>2</sup>)*

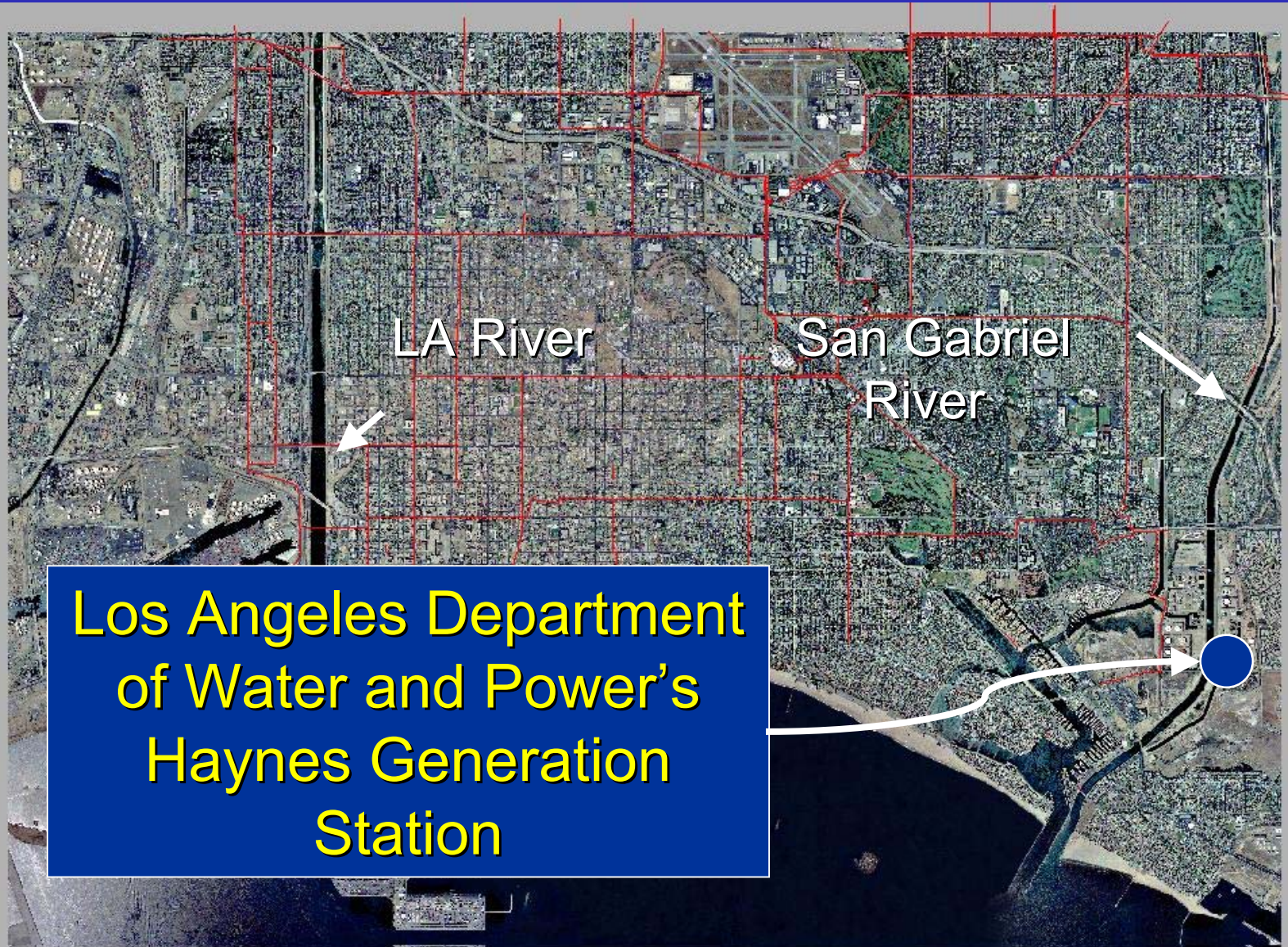
- 💧 Patent pending 2-stage process



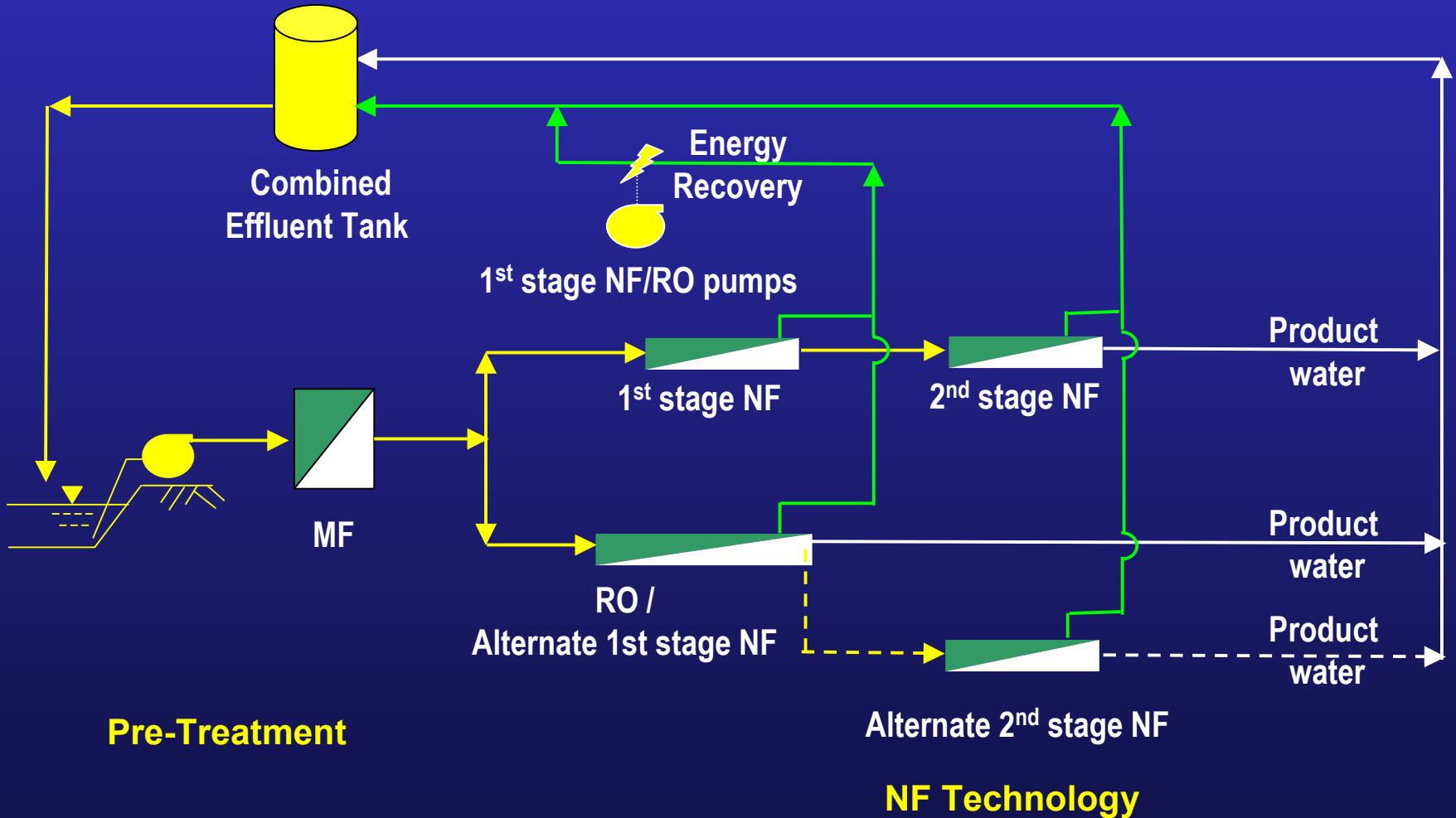
- 💧 Potentially Lower Energy Consumption
- 💧 2-pass Membranes for Added Water Quality Protection and Operational Flexibility



# *Site of Prototype*



# *Prototype Schematic*



# *Goals of the Prototype*

## 💧 **Optimize process to determine:**

- NF<sup>2</sup> performance vs traditional single pass SWRO
- Optimizing system integration
- Detailed capital and O&M costs

## 💧 **Evaluate long term performance:**

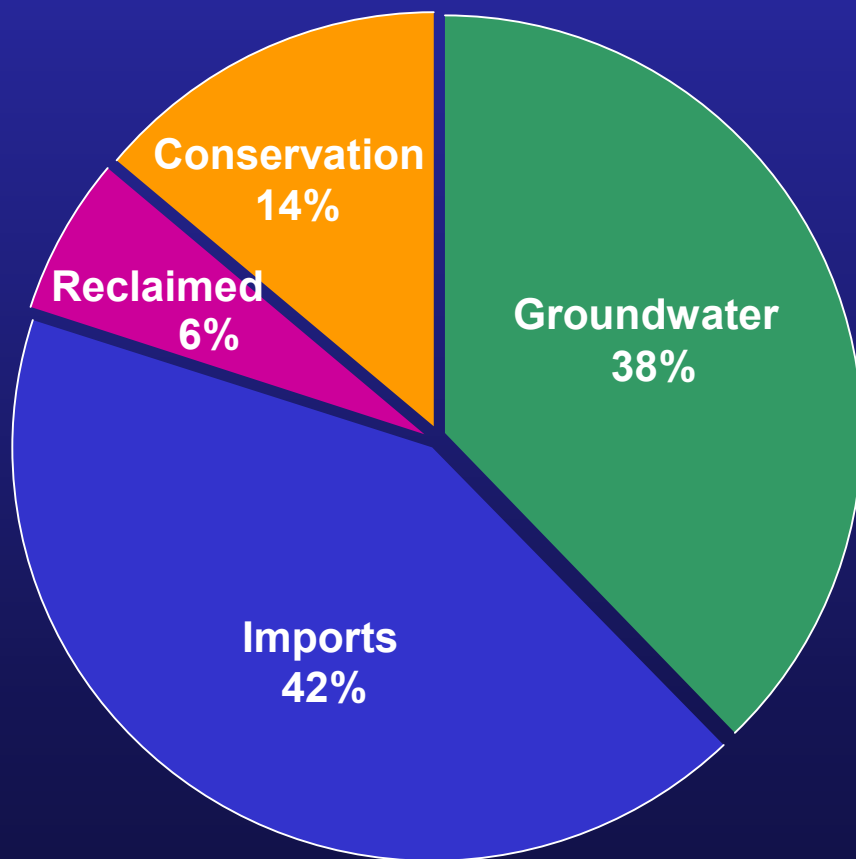
- Pre-treatment
- Membrane performance
- Water Quality
- Emerging contaminants (ie. Boron, Marine Biotoxins)

## 💧 **Provide sufficient information to regulators**



# ***LBWD's Resource Mix***

**2004**



**~2010**

